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## ABSTRACT

Research has shown that differences among ordinary people in intelligence and personality depend equally on individual genetic variability and on differences in the environments that siblings experience within the same family, not differences in the neighborhood, school, and community environments. As of yet, there are no adequate theories to explain how the environment works to affect personality and intellectual differences among people. Present interventions are based on naive environmentalism. If it is known what variations in environment make a difference, intervention programs can be better designed and implemented. In planning intelligent interventions, lumping human talents into a single domain may be useful, especially if focused on the practical concept of social competence. Theories on the role of intelligence and personality can be tested by the usefulness of the interventions they imply. Specific behaviors at specific times in people's lives can be changed, but the outlook for more pervasive aspects of people's functioning is pessimistic. A modest theory of general intellectual and personality development and of robust individual differences that underlie important human affairs, with the pessimism that implies about the effects of situationally-bound and time-bound interventions may be useful. (ABL)

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Intelligent Intervention

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## Intelligent Intervention

Behavior genetic studies of adoptive and biologically related families and of identical and fraternal twins have given us a great deal of information about the environment. Yes, you heard me -- not about genetics but about what aspects of environments do and do not affect human development and individual differences.

As Richard Weinberg and I (Scarr & Weinberg, 1977; 1978; 1983; Scarr, 1986a & b), Robert Plomin (1986), and others have stressed, the biggest surprise in all of our results is that differences among ordinary people in intelligence and personality depend in about equal amounts on individual genetic variability and on differences in the environments that brothers and sisters experience within the same family. Very little of the variance in normal development arises from the environmental variation we usually address with psychological or sociological theories -- that is, environmental differences among families and their correlated neighborhoods, schools, and communities.

Let me hasten to exclude from this generalization people who are growing up in inhumane, abnormal, or very deprived circumstances. I will also exclude minority families, because we know too little about them. The surprising finding in many studies now is that variation in the environments of working class to professional families matters little to their children's outcomes unless the children receive their genes from their parents; that is, adopted children growing up in this variety of circumstances are hardly affected at all by seemingly vast differences in their environmental circumstances. The worst problem is that we do not have any adequate theories of how these differences among siblings arise.

In fact, it has proved difficult -- nay, nearly impossible -- to discern any systematic differences in the experiences of siblings (Plomin, 1986) and twins (Gottesman, 1982) to explain the large differences in their development. If half or less of the variation in intelligence and personality are due to genetic differences, almost all of the rest seems to be due to unsystematizable environmental differences that occur unpredictably to members of the same family. As Gottesman has pointed out in the histories of twins where one or both have major mental illnesses, it is impossible to predict what kinds of stressors, when, and at what point of the lifespan will seem to be associated with episodes of clinical importance. For some people, the loss of a pet is perceived as a devastating event; for others, not at all. For some, a chance remark or a sideways glance is said to precipitate clinical episodes.

In the normal range of personality variation, Rowe and Plomin (1981) attempted to classify and study perceived differences in adolescent siblings' life experiences and to correlate those with differences in personality -- with very little success. In other words, we have as yet no adequate theories of how the environment works to affect personality and intellectual differences among people. Even though half or more of the variance in these characteristics is non-genetic, and we know it does not arise from differences among families, we do not have theories to explain it.

#### The Intervention Fallacy

This observation led me several years ago (Scarr, 1982) to propose that we who like to intervene to improve people's lives have no theory of the environment that permits us to make informed or intelligent choices about where and how to act. In fact, I asserted that we have no theory of environmental effects that is more than naive environmentalism -- a belief

that all important differences among people arise from differences in the opportunities they have or have not been given to learn.

If we really believed this, then the payoffs for making everyone's environments from the earliest months of life just like those of people who turn out to be what we value will be enormous. All we have to do is spread early stimulation of the middle-class variety, preschool education of the university nursery school kind, and schooling in classrooms like that which occurs in the wealthiest suburbs and private schools. While this program might be expensive, it would be extremely cost-effective, because according to naive environmental theory it would eliminate nearly all reading problems, behavior disorders, mental illness, retardation, criminality, and poverty. After all, the most advantaged environments produce people with very low rates of these undesirable characteristics.

However, as Richard Weinberg and I (1978) have noted:

In its baldest form, naive environmentalism has led us into an intervention fallacy. By assuming that all of the variance in behavior was environmentally determined, we have blithely promised a world of change that we have not delivered, at great cost to the participants, the public, and ourselves. The fallacy runs like this: if people who do X without our intervention have more desirable outcomes than people who do not do X, then we should persuade, or compel, all people to do X. This is unwise, because some of the reasons for the naturally occurring differences between those who do and do not do X are not just environmental differences. Many of these seemingly environmental variations are actually genetic differences or gene-environment correlations. People who are different do things differently.

But here is the most costly part of the intervention fallacy: the erroneous belief that small variations in environments within the "humane range" have meaningfully different outcomes for children. If we observe that professional families take their children to the theatre more often than working-class families, or hang mobiles above their cribs more frequently, some social scientists feel justified in recommending to everyone that they take in plays frequently, rather than play baseball in the backyard, or hang mobiles over the crib, rather than carry the baby about wherever they go. Since these are the child-rearing practices of the professional class, whose children excel at IQ tests and in school, all parents are advised to alter their child-rearing practices to follow suit. It has not been demonstrated that these variations in child rearing are functionally different in their effects on the children.

We can do a better job of designing and implementing effective intervention programs, if we know which variations in the environment make a difference and which ones do not. We can shift our resources to the improvement of those circumstances that have clear, environmentally deleterious effects on people. Many of these we know: we do not have to do research to know that hunger is not good for children, or that child abuse leaves scars. But there are many other marginal and less obvious practices and conditions that we can judge only from sophisticated research on the effects of those environments. So, it is important to know what aspects of the environment have consequences for behavioral differences, and which ones are only apparent variations, based on cultural preferences, genetic differences, or on gene-environment correlations. People

deserve respect for self-expression and their own modes of child rearing, unless there is a clear environmental reason to intervene. Behavior genetic methods will help us to gain a far clearer understanding of which environmental variables to worry about. (Scarr and Weinberg, 1978, p. 690).

### Theories of Development and Individual Differences

Underlying the acceptance or rejection of theories of human behavior is, I think, a more fundamental cultural context for ideas. Ideas about development and individual differences must fit into a larger, implicit view of human nature held by a culture. Ideas about human nature change with the times (Borstellman, 1983). In times of optimism, human nature is presumed to be perfectible, and individual differences due to easily remedied differences in experience. Development is a plastic process in which environments mold a shapeless blob. In pessimistic times, human nature is seen as difficult to change or even immutable. From such general cultural views flow ideas about development and individual differences, and from those flow theories about the efficacy of prevention and intervention efforts (Scarr, 1985).

A second consideration in judgments about the appropriateness of theories of development and individual differences is their implications for change or improvement. A primary principle of behavioral change is that the more limited the domain or more specific the behavior to be changed, the easier it is to effect the desired change. The more general or more inclusive the domain to be changed, the more difficult the intervention and less likely its success. Theories that imply a very large and heterogeneous domain of knowledge and behaviors to be changed, if individuals are to be perfected, present problems for optimistic interventionists. Very specific, particulate theories of behavior imply that faulty behaviors or deficient knowledge can be

more easily remedied. Thus, theories can be scaled along a dimension of relative optimism to pessimism about human perfectibility.

The relative optimism and pessimism implied by various theories can account for their shifting popularity; for, as the culture goes, so go prevention and intervention efforts. In times when humanity is considered perfectible through human efforts, theories that imply obstacles to perfectibility are unpopular. When pessimistic views about humankind are culturally accepted, theories which imply that changes in human behavior are difficult to accomplish are far more acceptable. (How about now?)

The cultural relativity of development and individual differences leaves theories, and the interventions they imply, at the mercy of the historical times and cultural places. Is this an accurate reflection of where we are and have been in this century? Indeed, I think so. One has only to recall the translation of Binet's hopeful developmental ideas at the turn of the century into the hardened geneticism of Terman and Goddard in the 1920s. Then, reflect on the rejection of trait theory under the domination of behaviorism's specifically learned, S->R connection. Today, we see the return of concern with human nature as a modifier of our preoccupation with nurture over the past 50 years. In the present climate, ideas about genetic variability are more acceptable than they have been in the past 50 years.

Are all views of development and individual differences as perfectible or intransigent equally useful? Despite my constructivist epistemology (Scarr, 1985) in which all ideas have cultural-historical contexts, I do think there are criteria of usefulness that are violated by the abandonment of a theory of the human species. I do not think it has proved useful, for example, to think that existing interventions with the mentally retarded will make them into normally-functioning, intelligent adults, even if one can teach them some useful, specific skills. The retarded still suffer a deficit in general

intelligence, higher levels of which lead others to learn more from their exposure to the same environments and to generalize and apply their knowledge from one situation to another (Campione, Brown & Ferrara, 1983).

Culturally-prescribed optimism about our ability to change human functioning has led erroneously, I think, to the depreciation of the importance of personality and general intelligence in human affairs. In this paper, I will dwell on the excessive dissection of personality and intelligence that leads to erroneous conclusions about the nature and efficacy of many kinds of interventions.

#### Particulate Intelligence: Part-Whole Problems

One dissection of general intelligence uses index variables, or items that belong to an IQ test, without acknowledging their relation to the whole. Usually the items seem to have face validity for some kind of everyday adaptation. Behaviors that are sampled by tests of general intelligence, such as knowledge and skills with cultural relevance are taken as specifically learned skills. Investigators select a specific intellectual, linguistic, or social piece of knowledge or skill and study its relations to other variables. Although there is no scientific law against such a practice, I will show that the inferences usually drawn from such studies are misleading, because they ignore the part-whole relation of specific knowledge and skills to general intelligence. I do not want to criticize any researchers in particular, so that I will invent summary examples of the kind of research that isolates IQ-test items and gives them causal status. Then, I will parody my own research.

A second set of variables often selected for isolated study are those not sampled on IQ tests but substantially correlated with test scores. In this category are many examples of social perception, social competence, and even personality.

### Knowledge and Intelligence

Take, for example, a study that hypothesizes that parents' knowledge of child development guarantees better child development: Parents who know more about the course of development will provide more appropriate environments for their children (books, educational toys, stimulating activities) than parents with less knowledge of child development. The hypothesis also states that children reared by knowledgeable parents will develop better intellectual skills than children reared by less knowledgeable parents.

Imagine a study in which parents were given a test of knowledge of contemporary facts about child development and their children were given a test of intelligence. Lo and behold, we find that knowledgeable parents have smarter children. The inference usually drawn from this result is that parent should be taught what is currently believed about child development so that they may become better parents who promote the intellectual development of their children. In fact, this strategy works with day care personnel (Arnett, 1986) to improve caregivers' management techniques, even though it has not been shown to change dramatically the children's development. The specific knowledge "model" of parent-child effects is shown in Figure 1:

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But knowledge of one domain is positively correlated with knowledge of other domains. Knowledge of contemporary child development is doubtless correlated with knowledge of musical composers, world geography, and the engineering of bridges. I do not know of any theory of child development, however, that posits that parents' knowledge of composers, geography, or bridges per se is causally related to children's intellectual development, unless one concedes that general knowledge is important in child rearing.

Indeed some investigators do. (These investigators usually ignore the implications of general cultural knowledge for a theory of general intelligence.) They highlight knowledgeable parents as (1) role models for or (2) information transmitters to their children. In this model, and those to follow, single headed-arrows indicate causal paths in the direction of the arrowheads, and double arrow paths indicate correlations without causal direction. The model of such developmentalists is shown in Figure 2:

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 Insert Figure 2 about here  
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Implicit in this model of knowledge transmission is a simple intervention: Give parents more knowledge and they will produce more knowledgeable children, a desirable outcome for everyone concerned.

#### Problems with Assumptions

Most developmental investigators have a fundamentally different epistemology from that of investigators of intelligence. The former believe that information is discrete and environmentally transmitted from parents to children. Knowledgeable parents provide more information for their children to learn than do less knowledgeable parents. Intelligence experts believe that general cultural knowledge is one of the best indicators of some more general intellectual ability, which is why cultural knowledge of all sorts is sampled on most IQ tests. Intelligence researchers believe that knowledgeable parents are more intelligent and that more intelligent parents have more intelligent children, who learn more about their cultural environments, not only from their parents but from the world at large. One possible model is as follows, in Figure 3:

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The implicit implications of this model of intelligence for intervention are not encouraging; therefore, this is not the first approximation to the knowledge-intelligence connection for psychologists who want to intervene to improve people's educational and occupational functioning. Most psychologists recognize that improving general intelligence with deliberate interventions is a formidable task. Regardless of its "truth" value, this model does not win popularity contests.

#### Oodles of Models

All of these models and others can account for the common observations; to wit: Intelligent parents tend to have intelligent children; knowledgeable parents tend to have knowledgeable children; intelligent parents tend to have knowledgeable children; and knowledgeable parents tend to have intelligent children. In any developmental model of parent-child effects, the nature of transmission and the nature of the intelligence-knowledge connection must be specified by theories. Choices among such partial models are not often empirically resolved, because all models are, in some theoretical contexts, true. How one construes the problems, accounts for the observations, and attempts to persuade others of one's model are the everyday problems of working scientists.

There is, however, an extremely important consequence of holding one or another model of intelligence and knowledge. Effective interventions depend on the accuracy of models to predict the payoff (Scarr, 1982). Path, or partial regression, coefficients are the best estimates we can make of the effectiveness of redistributing existing environments among existing genotypes. A seemingly easy manoeuvre to avoid the consequences of this claim is to say that novel interventions, those that have not been tried in the past, will render such path coefficients obsolete. If one is considering a radical, new treatment, such as vaccination for polio, then I can agree:

Previous estimates of the importance of genetic variability in susceptibility to the disease and environmental variations in exposure, will no longer predict which children will succumb to the disease. But, nearly all of our current interventions depend on redistribution of what are considered good practices to members of the populations who currently experience what we consider bad practices. In these cases, the estimates of intervention effects from path models certainly do apply.

Therefore, wishful thinking about knowledge transmission will not suffice to justify expensive and bothersome intervention programs, if the sole or major paths of parent-child influence are through intelligence and not through knowledge per se. Because developmental and intelligence investigators tend to have different causal models in mind, and different epistemologies, competing models are rarely tested against one another. This is not to say that they cannot be tested competitively, only that they rarely are. I will show later that competition can be a healthy goad to our ideas about development and individual differences and a prerequisite for effective interventions.

Other examples of items from IQ tests that are given causal status in developmental research can be found in language studies. Parents who speak to their children with larger vocabularies, in more complex sentences, with longer utterances, are often found to have more verbally complex and fluent children. Similarly, parents who use more sophisticated reasoning techniques with their children are said to induce more complex reasoning skills in their offspring. And so forth. In such studies, measures of parental and child behaviors taken in interactional situations are drawn from the same domain of behaviors that is sampled by items on tests of general intelligence. Therefore, it is hardly surprising that parental behaviors are found to

correlate with child behaviors. What is surprising is the investigators' willingness to attribute causality exclusively to the behavioral interactions.

#### Indirect Sampling of General Intelligence

Let's examine other kinds of knowledge and skills that are not sampled directly on tests of general intelligence but are correlated with IQ test scores. Whether or not such behaviors really belong to the domain of general intelligence, and whether or not they should be called personality or social competence, are matters of judgment and purpose. If one wants to argue that competent people must have both intelligence and social skills, which are correlated, one may prefer to lump behaviors into a competence domain by stressing their interrelatedness. If, on the other hand, one wants to distinguish intellectual processing from social skills and personality, one may want to emphasize distinctiveness over correlations. In either case, the observations are the same, even if the theoretically-determined "facts" are different. For the present, however, let us look at the confusions that arise for intervention from the failure to acknowledge that many social behaviors are intellectual correlates.

#### Peer Relations

As an example, the literature on peer relations considers children who are popular, isolated, and rejected by their peers. Differences in social status among these children are described as differences in knowledge of how to get along with others, how to time one's exchanges, how to listen and talk in satisfying dialogues, how to make a smooth entry into an ongoing group interaction, and how to protect oneself from aggression without committing unjustified attacks on others. In short, popular children have good social skills, and unpopular children have poor social skills.

Now, it also turns out that popular children usually have good school achievement and ability scores, whereas rejected children are often labeled as

learning disabled, held back in school, and placed in remedial classes. Children who are liked by peers are also liked by teachers; children who are disliked by peers are not the teachers' favorites either. Most often the correlations between social skills with peers and teachers, and school achievements are relegated to a minor result section, because the implicit model in research on peer relations is as follows, in Figure 4:

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This model stresses the poor peer relations of some children as the cause of both their more general poor school adjustment and their poor school achievement. Implicit in this model is an intervention strategy: If one could improve their peer relations, one would also improve their relations with teachers and their school achievement and ability scores.

One can easily imagine another model or two (or ten) to account for the same data. One model could emphasize the crucial nature of school achievement for school adjustment with both teachers and peers. Children who do not read or do math well, in this model, suffer poor relationships with teachers and peers in the school setting. They are rejected by their higher-achieving peers and disliked by teachers, who find them unsusceptible to their best teaching efforts.

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 Insert Figure 5 about here  
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The intervention strategy implied by the model in Figure 5 is that improving a child's academic skills will improve his social adjustment with both peers and teachers. The causes of poor social adjustment in school, therefore, are seen as primarily academic.

Another model of the same data stresses the importance of intelligence for both academic achievement and social skills with teachers and peers. This model is shown in Figure 6.

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 Insert Figure 6 about here  
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An intervention strategy implied by this model might advise schools to reduce the intellectual variability among peers in a classroom and to give teachers more realistic expectations of the social skills that children with different levels of intelligence are likely to have. Because general intelligence is such a broad concept of functioning, it is difficult to imagine interventions that would aim to improve "g" directly.

The correlations among peer and teacher social relations and school achievement lend themselves to competing interpretations, which are rarely considered in the same articles. One of the principal reasons for the neglect of competing models is the wishful thinking of good-hearted interventionists: It is far easier to fix a child's peer relationships or even more general social skills than to fix low intelligence or learning deficits.

#### Parent-Child Relations

A similar phenomenon can be seen in parent-child relations. In the domain of social behaviors, which are not usually sampled on IQ tests, the same dangers of inference lurk. In a recent paper (Scarr, 1985), I reviewed some data on the "effects" of parent management techniques on children's intellectual, language, and social development. The data are from a longitudinal study of mothers and children from the ages of 24 to 42 months. We applied competing models to the observed correlations in parent and child behaviors. Some models have more optimistic implications for intervention than others, but that does not make them useful.

In this study we took both proximal measures of the interactions of parents and their children at Times 1 and 2 (24 and 42 months, respectively). We also took more distal measures of parent and child characteristics -- knowledge and skills that are not bound by the interactional situations we observed and rated. Having been influenced by trait theories of intelligence and personality, I tested cross-situational traits and situational variables in competing models of parent-child reciprocal influence.

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 Insert Figure 7 about here  
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#### Parental Predictors

First, let us look at a couple of proximal parental variables, maternal control of child rated from a 15-minute observation of a teaching situation and scores from an interview with mothers about their methods of disciplining their children in the face of typical misbehaviors. Both measures have suitably high reliabilities and have been scored to yield a positive to negative dimension of parental management techniques. At the positive end are reasoning, explaining and other verbal ways of dealing with young children. At the negative end is physical punishment. In the middle are various moderate to severe forms of admonishment. Figure 7 shows the relationships of maternal discipline and control to child IQ.

The prediction of children's Stanford-Binet IQ scores over an 18-month period (Time 1 to Time 2) is quite good. Both positive control techniques observed and positive discipline scored from the discipline interview significantly predict child IQ concurrently ( $r$ 's = .42 - .49) and 18-months later, with an R-square of .23.

Psychologists with a proximal model might stop there, write their papers and "prove" that positive parental management has a beneficial effect on

intellectual development. The inference usually drawn from this sort of result is that parents who do not manage their children in positive ways could have more intelligent children if they did. The implications for intervention with parents are clear: If only psychologists could help all parents to behave positively toward their children, their children would turn out to be brighter. As the editor of a developmental journal, I receive many papers of this sort.

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 Insert Figure 8 about here  
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As an investigator, however, I cannot resist examining the following result, in Figure 8. When two more distal variables, mother's WAIS vocabulary score and her education, are put into the equation, mother's IQ dominates the prediction of her child's IQ. Mother's IQ determines in large part how she behaves toward her child in the teaching situation, and contributes to her discipline techniques. Her educational level is of little importance to her behavior or to her child's IQ, once her own IQ is estimated from her vocabulary score. The only significant predictor of the child's IQ at 3 1/2 to 4 years of age is mother's WAIS vocabulary. The most striking findings in Figure 8 are the intimate connections between mother's intelligence and her behaviors toward her child. Intelligent mothers use more positive discipline and control techniques. And, of course, the overall prediction of child IQ is greatly improved by the addition of mother's vocabulary to the equation.

The implications of this result for improving children's intellectual functioning by intervention in mother's control and discipline techniques are dismal. Even if one could dramatically improve mother's positive behaviors toward her child, her improved behavior would have little payoff in the

child's IQ score. Whereas the proximal results promised some payoff for children's intellectual outcomes, more distal variable undercut that model.

Perhaps, this result is peculiar to IQ. Let us look at child's communication skills, a score from the Cain-Levine Social Competence Scale (Cain, Levine & Elzey, 1963), answered by the mothers. Again, mother's positive control and discipline techniques at Time 1 predict the child's communication skills at Time 2 as shown in Figure 9. If only all mothers would manage their children in more positive ways, their children would be better able to carry messages, remember instructions, answer the telephone, and tell stories.

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Insert Figures 9 & 10 about here  
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But again, the importance of these proximal predictors pales in comparison to mother's vocabulary score, as shown in Figure 10. Children with good communication scores have mothers with high WAIS vocabulary scores. Any importance of maternal management techniques is mediated by maternal IQ. Mothers who are smarter behave in more benign ways toward their children, and their children have better verbal skills. Improving mother's discipline and control techniques will not dramatically improve children's language skills, even though the proximal results seemed to offer this hope.

Perhaps, these results apply only to cognitive outcomes for children. Let us look at social adjustment in Figure 11. The Childhood Personality Scale (Cohen & Dibble, 1976) was rated by both mothers and observers. The average of their scores was entered into a principal components analysis, which resulted in one, large dimension of social adjustment -- high expressiveness and attention and low apathy and introversion -- as shown in Table 1.

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Figure 11 shows that positive maternal discipline predicts a well-adjusted child. Mothers who handle their children in benign ways have children who are more expressive and attentive and less withdrawn. The relationship between positive maternal discipline and child adjustment is sustained after the two maternal IQ and education variables are entered into the equation. This model is shown in Figure 12. Maternal vocabulary does not make a statistically reliable contribution to child's social adjustment, apart from its contribution to her discipline techniques. Changing mothers' discipline and control techniques could have some payoff for children's social adjustment.

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 Insert Figures 11 & 12 about here  
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Thus, we can see that the proximal variables of maternal control and discipline techniques can mask the relationships between maternal IQ and child's intellectual skills but contribute directly to the child's social adjustment. With a theoretical model that included only proximal variables, we could not have perceived a difference in the prediction of children's social and intellectual outcomes. Without testing proximal versus distal variables, we would not have invented differential models for social and intellectual development and potential forms of intervention.

I can "demonstrate" with the same data that bright children cause their mothers to be better educated. As Figure 13 shows, high-IQ two year olds with good communication skills produce mothers with higher educational levels, regardless of whether or not the children cooperate in a teaching task. Implausible, you say! I agree that this model is implausible, because we have

independent information about the educational histories of adults that make it very unlikely for a mother to obtain more education or to drop out of school according to her preschooler's IQ score. To imagine that preschoolers' intelligence determines their mothers' educational levels violates criteria of plausibility -- and ultimately our credibility. But imagine the intervention that could be launched to raise mothers' educational levels! Because the same results can be shown for children's "effects" on their mother's IQ scores, we could aspire to improve the intelligence of mothers by making their children smarter!

### Intelligent Interventions

Models of maternal and child behaviors can be constructed from common observations to "prove" just about anything a theory could want. Only when there is information independent of the model and the immediate data used to test it, do we see the implausibility of some constructions, as in the case of preschoolers' IQ scores determining their mothers' educational levels. In most cases of peer, teacher, and parent-child relations, we do not have compelling information that rules out any plausible models. Rather, we have competing models that are seldom put into competition.

If causal models of many parent-child, peer, teacher, and other human connections are difficult to specify and test, how shall we plan intelligent interventions? For some purposes, lumping many human talents into a single domain may be useful, especially if one focuses on the practical importance of the concept, social competence. Getting along well in school, with peers, and in many occupations such as sales, public relations, counseling, and the like, requires personal attributes of extraversion, self-confidence, low anxiety, and social perceptiveness, all of which are positively correlated with each other and with traditional intelligence in the general population.

I have argued (Scarr, 1981) that assessments used to predict children's functioning in school ought to sample more broadly from these related areas of personality than from only the traditional intellectual abilities, because effective functioning in the school context requires more than verbal and numerical intelligence. Similarly, Robert Hogan (1985) stresses the importance of social knowledge and skills to occupational success. Indeed, David Wechsler (1974) described intelligence as one aspect of personality, which for him was the more generic concept for human adaptive functioning.

Arguments against lumping intelligence into the broader domain of personality center on the loss of precision. A broad adaptional view that includes intelligence with other aspects of personality that affect one's overall ability to get along well in the world of people, jobs, and personal pursuits may not suit an information-processing or problem-solving theory that focuses on the internal processing of restricted kinds of information. Processing meaning from human facial expressions may require quite different procedures from processing verbal syllogisms. Both are legitimately useful human skills, but a theory about one may not promote research on the other. A theory about both may be at so abstract a level as to be untestable and fail to provide empirical guidance. There is room in the world of theories for useful ideas about facial expressions or syllogistic reasoning.

#### Correlated Pluralism

Denial that many aspects of human personality, including intelligence, are correlated is folly. As Paul Meehl remarked many years ago, all good things are correlated. Wishful thinking about the independence, and presumably compensatory distribution, of human abilities, advances neither science nor practice. The hope of the multiple intelligence theorists seems to be that being good at one kind of activity does not guarantee excellence in another, and that being poor in verbal and numerical intelligence does not

mean that you cannot be a genius in some other arena. Alas, the world is not that just.

In my opinion, the breadth of the personality-intelligence domain will not be settled on logical or theoretical grounds but on criteria of usefulness. For some purposes, a more restricted definition will serve the analysis of and intervention with specific information processing skills (Sternberg, 1985). For other purposes, a more inclusive definition will foster the exploration of broader human adaptations. Arguments about definitions of intelligence, and personality apart from their purposes, are vacuous and futile, as thousands of pages in professional journals will attest.

The critical issue is that each theory of development and individual differences implies some form or forms of intervention, and each intervention promises a payoff in some desired change. If the intervention does not deliver that payoff, when tested, it should be replaced by other interventions implied by other theories that do deliver on their promises.

#### Promises. Promises

Not all promises about the effects of intervention are positive or optimistic. Models that stress the role of general intelligence and global personality in human affairs promise that specific interventions will have little payoff beyond the immediate behaviors they address at the time they are addressed. For example, teaching parents to use positive behavior management strategies with their young children will not generalize to help those parents manage their children as adolescents, because the specific parental behaviors taught to parents of preschoolers must be different from those that are appropriate with adolescents.

More and better adjusted intelligent parents seem more likely to adjust their parenting techniques to the developmental level of the child, even

without specific training. Less intelligent and poorly adjusted parents can benefit from specific training in parenting techniques with given children at given ages, but a theory that stresses the role of general intelligence and global personality in parenting behaviors would predict that the less intelligent parents must be trained again and again to match their behaviors to the demands of parenting others of their children and the same offspring when they are older children and teenagers. (Fortunately, in training day care workers to behave in more benign ways toward the young children in their care, they have a limited domain of knowledge to master.)

A theory of parenting that does not refer to general intelligence might predict that parent training will be generalized, once the principles of parenting had been grasped. I submit that there is little evidence in the literature on which to base this hope. Parent training, when evaluated, has shown little generality and little carryover (e.g., Ramey, et. al., 1986) nor do I guess that training day care workers to work with 3-year olds will help them to be effective with 13 year olds.. The alternative prediction is that only specific behaviors with specific applications have been learned; that is, parents can now cope with the four or five behaviors targeted for change in this specific child at this specific age. I find this neither an optimistic position nor one that is distinguishable from the intervention results predicted by a model of general intelligence. Specific knowledge models without the promise of generalization are merely black-box theories that ignore the role of general intelligence and personality in benign parenting.

Similarly, a model of peer relations that addresses only the situational behaviors of isolated and rejected children can probably show some efficacy in improving the children's social skills in those situations at that given age. But a model of general intelligence, personality and social competence

underlying social skills predicts that such interventions will have little generality across time and situations.

Interventions, like other forms of reality, must be theory-driven and must have contexts -- social, cultural, and historical. Without a theory of the importance of early experience, we would not have had Head Start. If we had a theory about the importance of adolescence, we might have Teen Start -- probably not a bad idea, if it had occurred during the Baby Boom glut of adolescents on the school and job scene a few years ago. With a theory about the fixity of genetic traits, we had the Eugenics Movement. With a theory about genetic variability of a probabilistic sort, we could have more respect for individual differences in behavior. With this theoretical lens, we would blame parents less for their problem children and praise them less for their wonderful ones.

If we had recognized the time-boundedness of the father-absence problem, we might have acted differently toward black families and teen-age mothers. Intervention programs with mother-child families were driven by deficit theories. What if we had viewed father-absent families as blessed by mother-child integration, without the distractions of a sexual partner for mother? (Could this be another kind of sainthood?) Could one conceive of the mother-child household as beneficial for children?

Suppose we had considered alternative theories about early experience and the permanence of everyday traumas. We might have spent less time looking for far-flung sequelae of temporary maternal separations and more time looking at people's current lives. Suppose we thought, like our ancients, that children's sensibilities began at the age of 7. We might have worried less about mother-infant bonding and more about the emotional effects of peer group rejection. If we had considered more distal variables, we might have put more money into effective public transportation than into job training for the

unemployed, who could not reach potential jobs even if trained. If we had conceptualized the school problems of blacks in the 1970's as lack of exposure to the norms of the majority culture, rather than as racial discrimination, we might have launched Second Culture Programs rather than Affirmative Action.

The effectiveness of the theory-spawned interventions will be judged in the same cultural context that generated the theories in the first place. Therefore, arguments about the efficacy of interventions will take place within a discussable range of beliefs. How can we go wrong? Or right?

Let us examine the disadvantages and the advantages of a constructivist science and intervention. The disadvantage of this view over the current realism is that one may feel less certain of what one is doing. How can one know what is Right, if there is no Right? The feeling can resemble the loss of faith in a familiar and comforting religion. Theories make conflicting claims that cause one to have to think and choose -- uncomfortable processes for many people. One is thrown onto one's own resources to invent a plausible story in the face of certain ambiguity.

The advantage of this view is that one can make more modest one's claims about the ultimate Truth, which leaves one less embarrassed when other theories replace one's favorite view. A second and more important advantage is that one can modify one's ineffective attempts to change others' behaviors more easily, because one recognizes that one may have constructed the problem inappropriately for the time and space. It makes easier the invention of other questions and other approaches to a perceived problem.

The implication of this appraisal of science and policy is that arguments about intervention strategies are constrained within discussable limits. Conversations about what to do to improve people's lives can take place within a framework of shared images of human nature and proper human relations. This is not to say that important variations are not present in the current

cultural ethos. Indeed, vigorous advocates of mental health programs compete for funds with others who advocate medical interventions, better education, and other means by which they optimistically intend to improve people's lives. But no one of any influence calls for public whippings, isolation of babies from their mothers, the reinstatement of slave labor, or a return to the orphanages of the yesteryear. No, our current views of human society preclude such popular ideas from the past.

Any given theory and the intervention it launches are of limited usefulness -- limited by the sociocultural time and space in which they occur. Why should we expect more? Why should we want more? The major disadvantage of realism in science is that it deludes believers into searching to discover facts that exist apart from theories about them. It seems to me much harder to be flexible in one's theory construction and intervention strategies if one believes there is a reality out there to be mirrored (Rorty, 1979). A constructivist view frees one to think the unthinkable, because one's view of "reality" is constrained only by imagination and a few precious rules of the scientific game. The problem is to persuade one's scientific peers and policy makers that one's variation on the cultural theme is the wave of the future.

Competing models about the role of intelligence and personality in parenting and peer relations are testable. Even if alternative models are not often tested, the interventions that are implicit in each theory can be tested. Put simply, a theory can be tested by the usefulness of the intervention it implies. As Urie Bronfenbrenner is fond of saying, quoting his own mentor, "If you want to understand something, try to change it." I have great confidence that we can effectively change specific behaviors at specific times in people's lives. This is not a trivial claim about the efficacy of behavioral programs to overcome phobias, in treating alcoholics and drug addicts and in preventing abuse of small children. But it is a

pessimistic hypothesis about our abilities to change more pervasive aspects of people's functioning. To date, I will put my bet on a theory of general intellectual and personality development and of robust individual differences that underlie important human affairs, with the pessimism that implies about the far-flung effects of situationally- and time-bound interventions. Modesty will become us all.

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## FIGURE CAPTIONS

## FIGURE

- 1 A SPECIFIC-KNOWLEDGE MODEL OF PARENT-CHILD EFFECTS
- 2 KNOWLEDGEABLE PARENTS PRODUCE KNOWLEDGEABLE CHILDREN
- 3 INTELLIGENT PARENTS PRODUCE CHILDREN WHO ARE INTELLIGENT AND  
ALSO KNOWLEDGEABLE
- 4 POOR PEER RELATIONS CAUSE POOR SCHOOL ACHIEVEMENT AND POOR  
SCHOOL ADJUSTMENT
- 5 POOR ACADEMIC ACHIEVEMENT CAUSES POOR SCHOOL ADJUSTMENT AND  
POOR PEER RELATIONS
- 6 LOW INTELLIGENCE CAUSES POOR SCHOOL ACHIEVEMENT AND POOR PEER  
RELATIONS
- 7 PROXIMAL MATERNAL BEHAVIORS AS PREDICTORS OF CHILD'S IQ
- 8 PROXIMAL AND DISTAL MATERNAL PREDICTORS OF CHILD'S IQ
- 9 PROXIMAL MATERNAL PREDICTORS OF CHILD'S COMMUNICATION SKILLS
- 10 PROXIMAL AND DISTAL CHARACTERISTICS OF MOTHERS AS PREDICTORS  
OF CHILD'S COMMUNICATION SKILLS
- 11 PROXIMAL CHARACTERISTICS OF MOTHERS' AS PREDICTORS OF CHILD'S  
SOCIAL ADJUSTMENT
- 12 PROXIMAL AND DISTAL MATERNAL PREDICTORS OF CHILD'S SOCIAL  
ADJUSTMENT
- 13 PROXIMAL AND DISTAL CHARACTERISTICS OF CHILDREN AS PREDICTORS  
OF MATERNAL EDUCATIONAL LEVELS

**Table 1**  
*Social Adjustment Factor: Combined Ratings of  
 the Childhood Personality Scale by  
 Mothers and Raters*

| Component      | Rating |
|----------------|--------|
| Attention      | .61    |
| Expressiveness | .76    |
| Introversion   | -.81   |
| Apathy         | -.60   |

*Note:* The significance is  $p < .05$ .

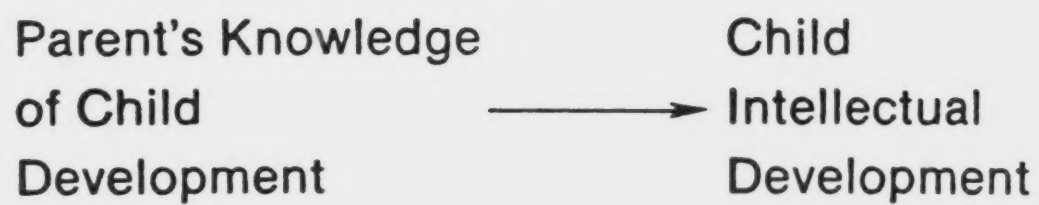


*Fig 1*



Fig 2

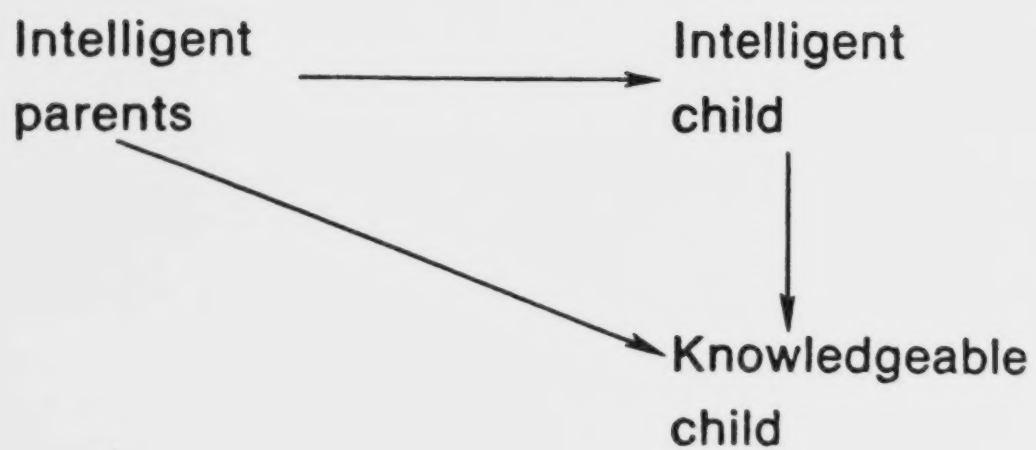
*Fig 3*



*Fig 4*

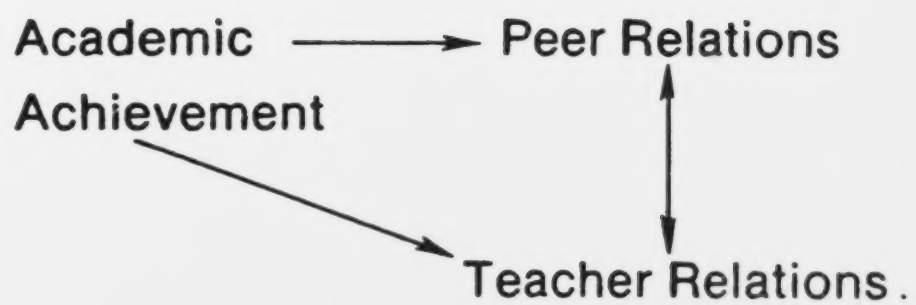


Fig 5

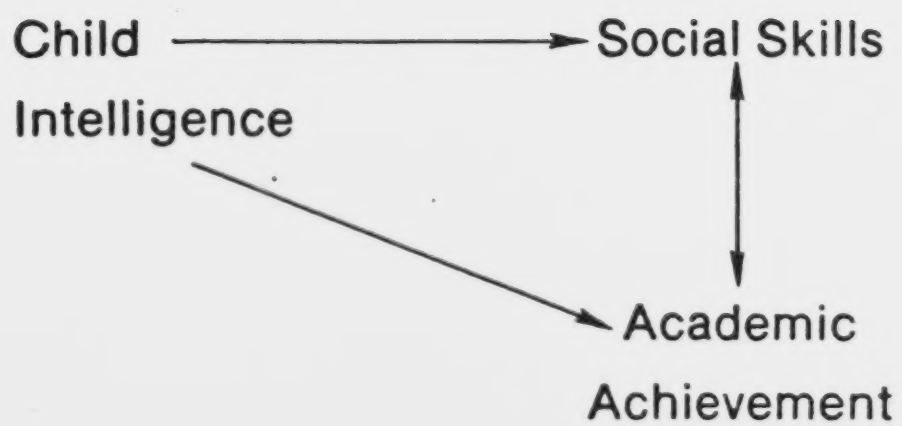


Fig 6

**Fig 7**  
*Proximal Maternal Behaviors as  
 Predictors of Child's IQ*

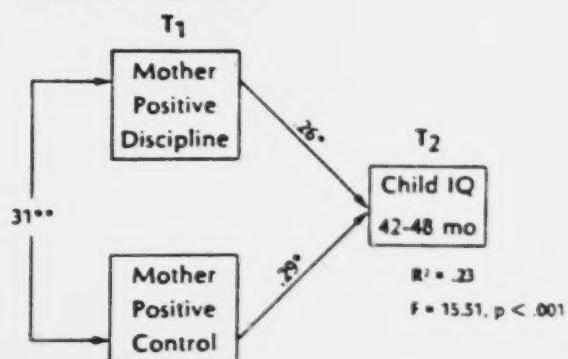
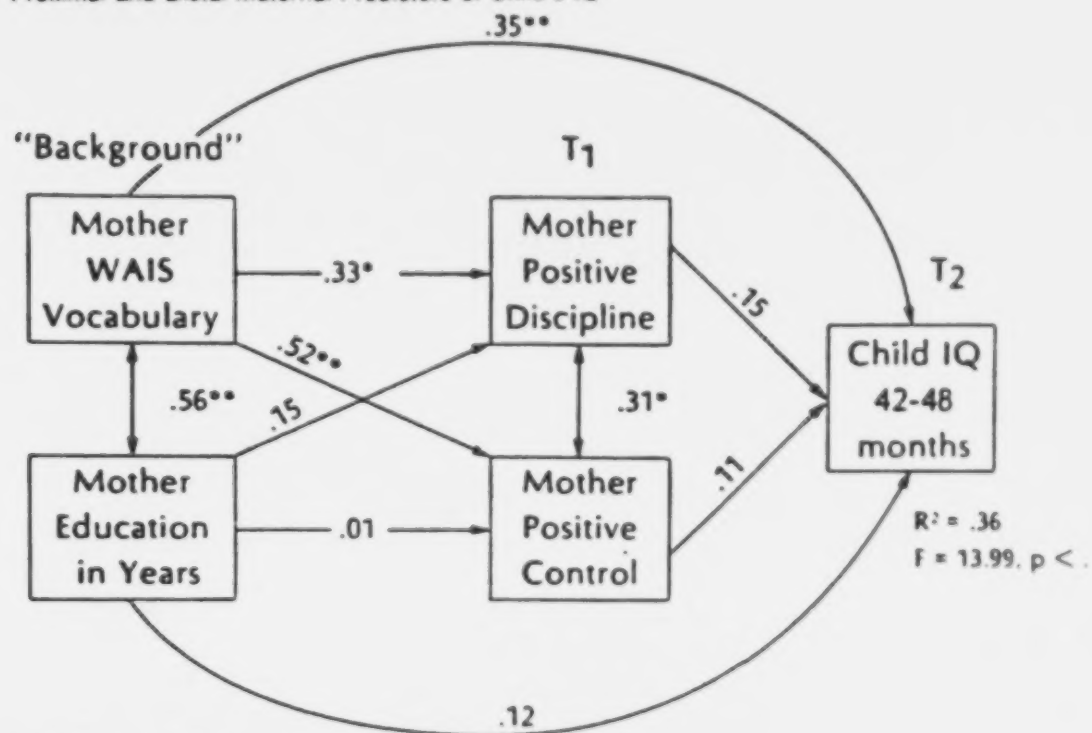
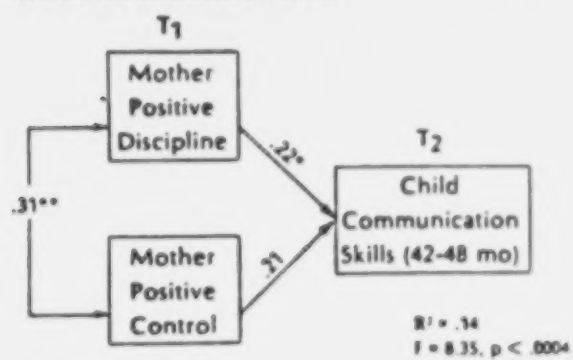


Figure 8  
Proximal and Distal Maternal Predictors of Child's IQ

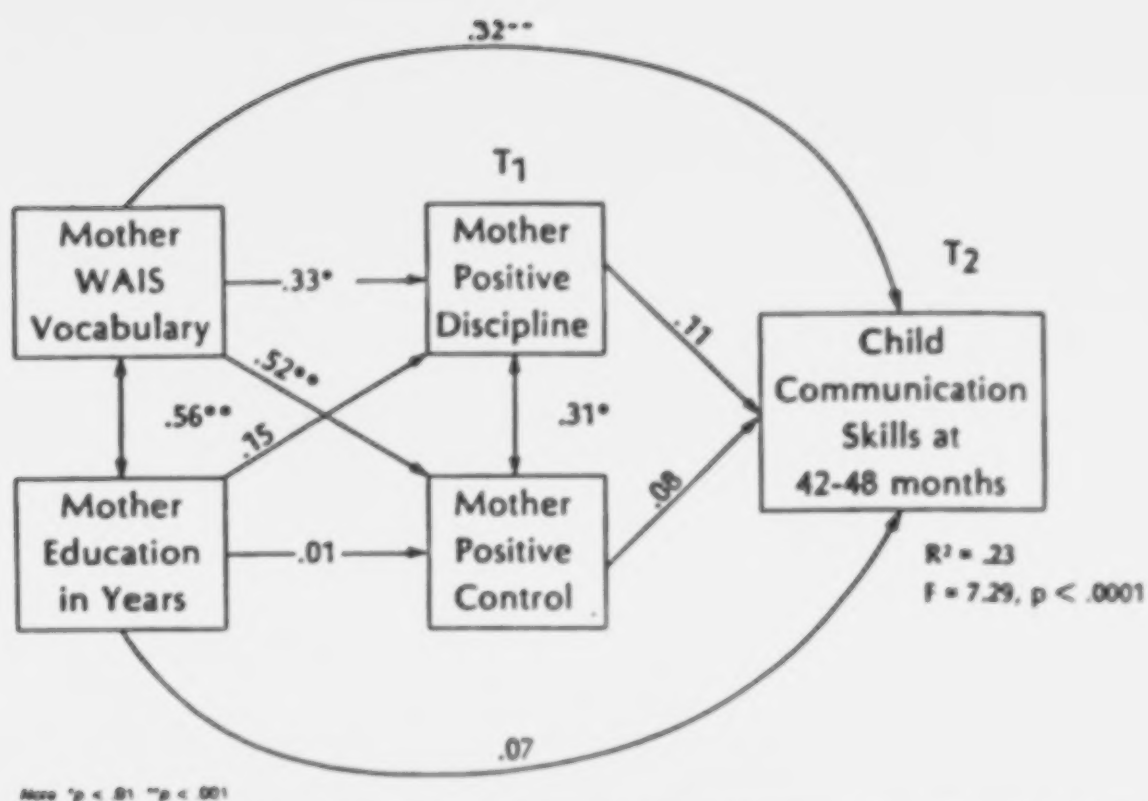


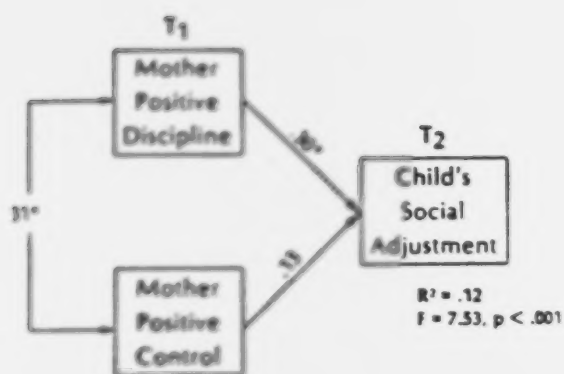
Note:  $^*p < .01$   $^{**}p < .001$

**Figure 9**  
*Proximal Maternal Predictors of  
 Child's Communication Skills*



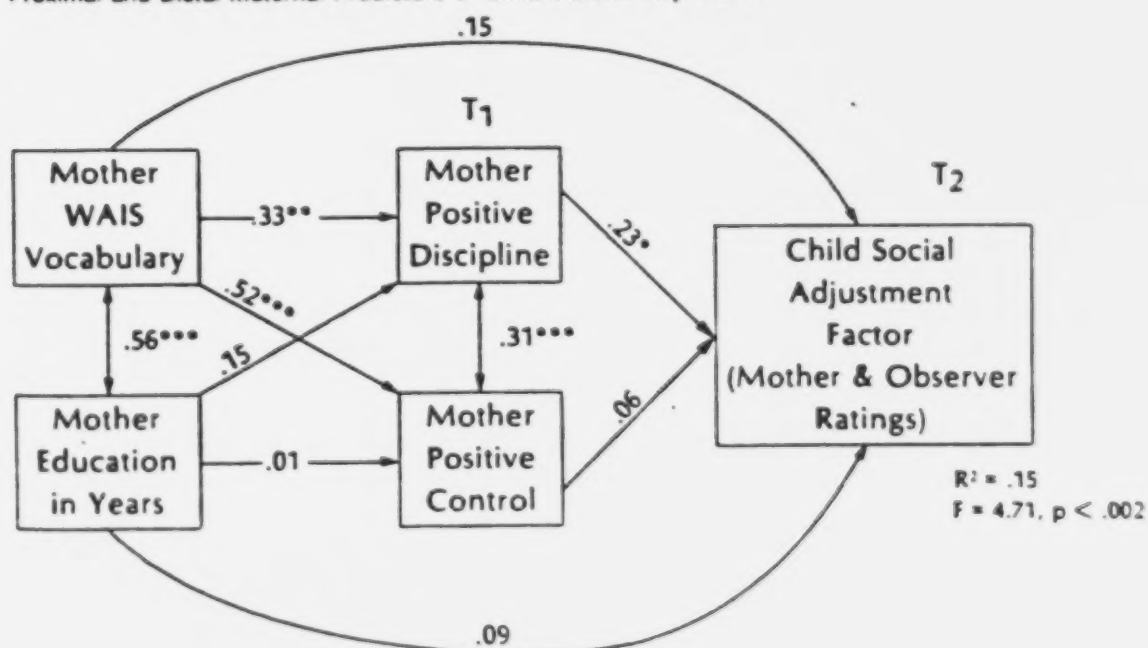
Note:  $^*p < .02$   $^{**}p < .01$





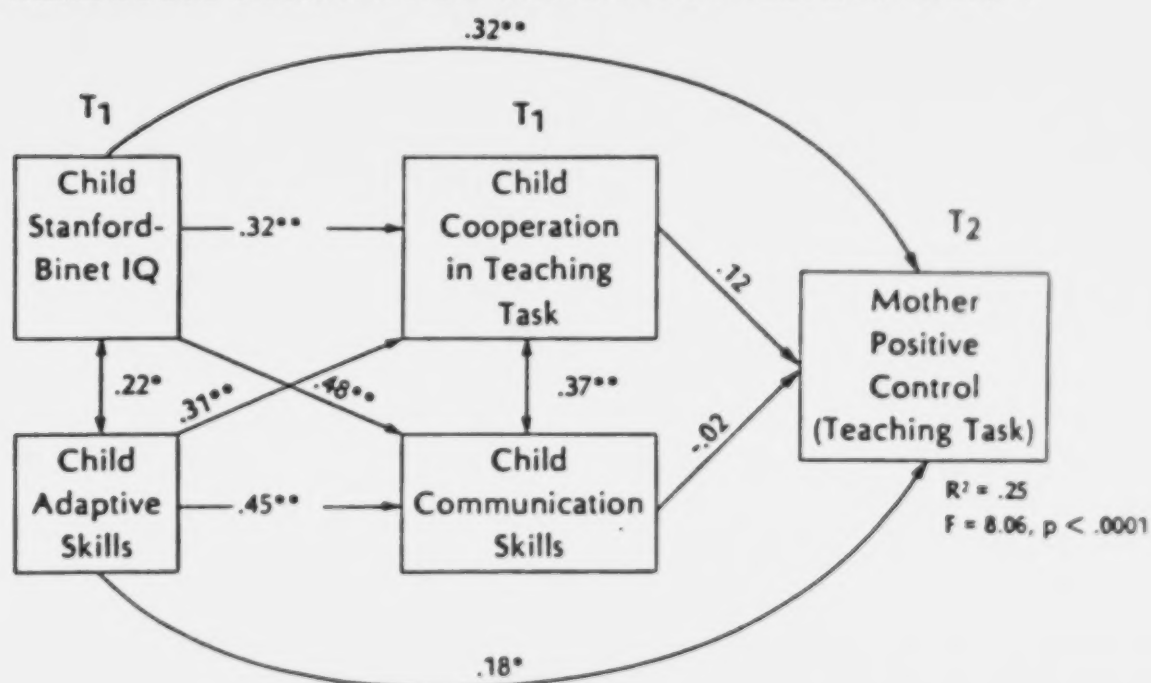
Note: \*p < .01.

Figure 12  
Proximal and Distal Maternal Predictors of Child's Social Adjustment



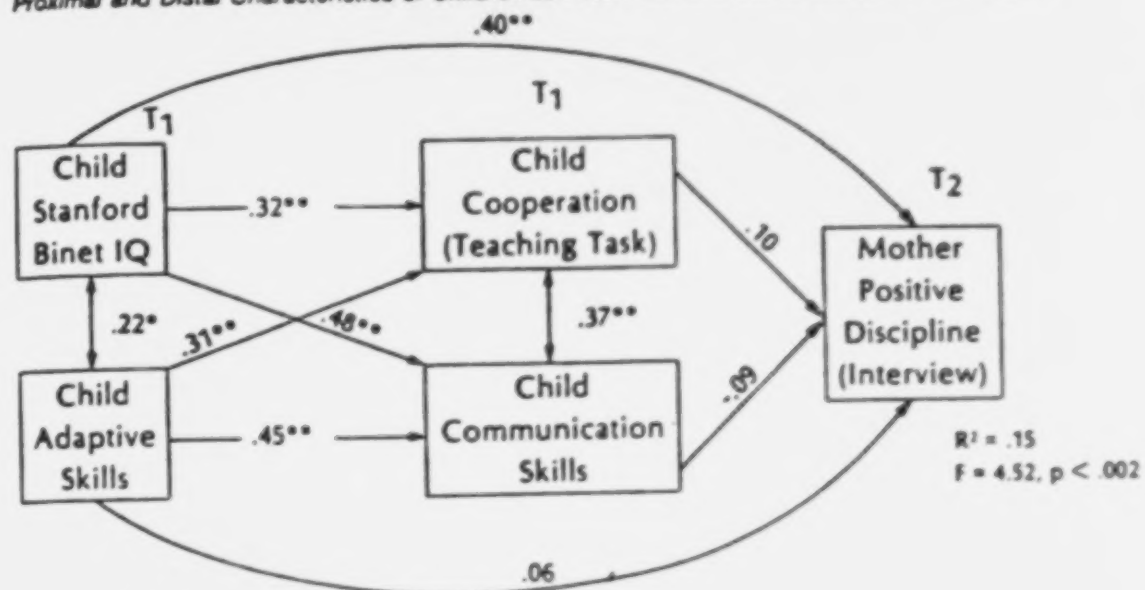
Note: \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

**Figure 13**  
*Proximal and Distal Characteristics of Children as Predictors of Maternal Control Techniques*



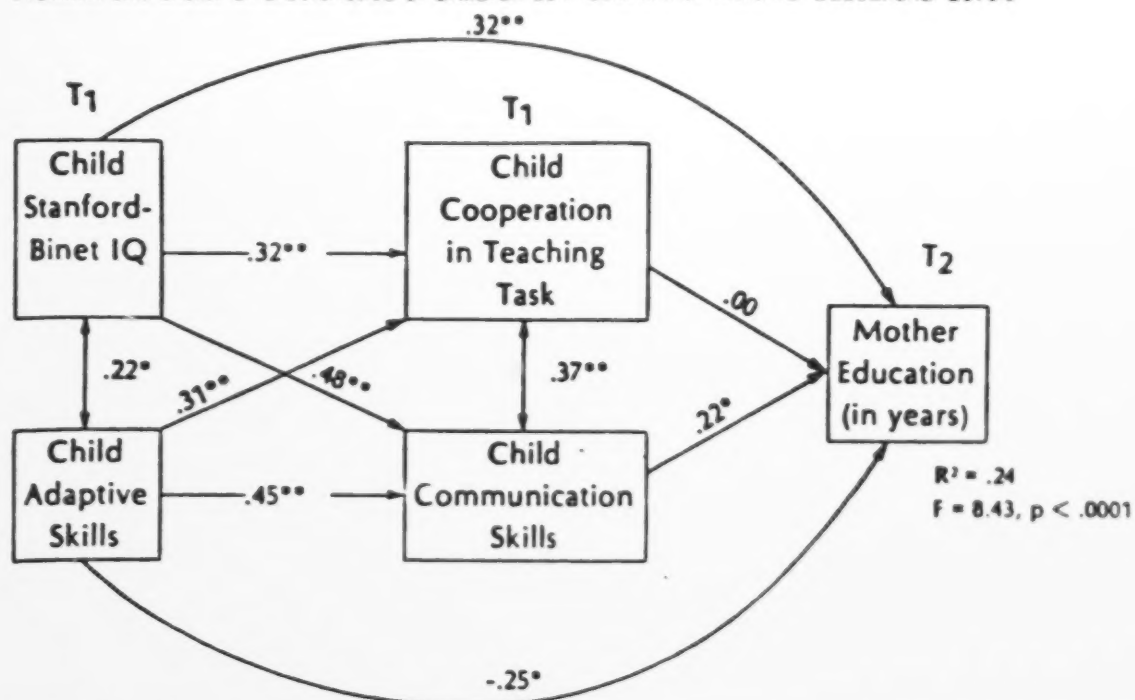
Note:  $^*p < .05$   $^{**}p < .001$

Figure 14  
Proximal and Distal Characteristics of Children as Predictors of Maternal Discipline Techniques



Note: \* $p < .05$  \*\* $p < .001$

Figure 15  
Proximal and Distal Characteristics of Children as Predictors of Maternal Educational Levels



Note: \* $p < .05$ , \*\* $p < .001$